REMARKS/ARGUMENTS

The present application contains claims 1-11 and 14-52. Claims 14-52 have been withdrawn as being directed to a non-elected invention. Claims 12-13 have been canceled without prejudice. Claims 1 and 3-11 have been amended.

It is noted that a response period of three months has been set for responding to the non-final Office Action. It is submitted that this Amendment, together with a Petition for One-Month Extension of Time is timely filed.

It is noted that claim for foreign priority has been acknowledged and that the certified copies of the priority documents have been received.

In reference to the Detailed Action, it is noted that claims 14-52 stand withdrawn being directed to a non-elected sub-combination, it being understood that the withdrawn claims may be reinstated.

Claim Rejections - 35 U.S.C. §101

Claims 12 and 13 have been rejected under 35 U.S.C. §101 as failing to fall within one (1) of the four (4) statutory categories of invention. Claims 12 and 13 having been canceled, it is submitted that this rejection is now moot.

Claim Rejections - 35 U.S.C. §112

Claim 6 has been rejected under 35 U.S.C. §112, second paragraph. Responsive to the Examiner's position that the language "on time-series" is unclear. Claim 6 has been amended to recite "on time-series data" as suggested by the Examiner and it is submitted that this rejection should be withdrawn.

Claim Rejections - 35 U.S.C. §103

Claims 1 and 12 have been rejected under 35 U.S.C. §103(a) as unpatentable over Andrew C. Gallagher (U.S. Patent Application Publication No. 2003/0215230) (hereinafter, "Gallagher"). Claim 12 having been canceled without prejudice, this rejection is respectfully traversed as regards amended claim 1.

Gallagher is limited to teaching distortion correction method and apparatus wherein a lens 3 arranged along an optical axis 7 and exhibiting field curvature and distortion, focuses an image on the cylindrical image surface 5. Although Gallagher refers to the image surface as flat photographic film, the text in paragraph [0021] at page 2 states that the image surface may be an electronic sensor comprised of photo-sensitive image pixels forming a cylindrical surface in which the short dimension 5a of the image surface is linear while the long dimension 5b is curved (see Fig. 1).

As shown in Fig. 3, an image derived from surface 5 is digitized at unit 2 to obtain a digital image, which is then subjected to distortion correction at unit 6 converting the digital image i(x, y) to an output image o(m, n) as described in paragraphs [0026]-[0027] on page 3 of Gallagher.

A distortion model (formula) set forth in paragraphs [0028]-[0037] is utilized to govern the mapping of locations of the output image relative to locations of the input image. Thus, Gallagher employs a distortion corrector 6 utilizing certain distortion parameters to convert the input image i(x, y) which requires correction of distortion, to generate the output image o(m, n). As a result, if the map locations obtained from distortion corrector 6 are outside the input image region where there is no image data, the output image o(m, n) is set to a default value (0 or 255) or to a value of the nearest pixel of i(x, y), to prevent the problem that values of peripheral portions in the output image come unstable as a result of utilizing the entire input

image as the input image region necessary for performing distortion correction processing, as described in paragraph [0027]. Gallagher specifically states that "preferably, the output image has the same number of rows and columns as the input digital image."

In contrast, the apparatus of the present invention obtains block data (see the bow-shaped image data shown, for example, in Fig. 10 of the present application) is obtained by dividing a distortion-corrected image data in an input image range from the block image data divided from the image data **before** distortion correction processing is calculated, and obtained by performing coordinate transformation on the block image data. The input image range, since it is acquired as a rectangular region containing the block image data (the bow-shaped image) obtained by the coordinate transformation, the image region is always larger than the output image and thus it never occurs that the output image has the same number of rows and columns as the input image.

In addition to the above, Gallagher fails to teach or even remotely suggest "sequentially performing distortion correcting processing on block image data (e.g., a block line) obtained by dividing the image data" and "calculating an input image range necessary for performing distortion correction processing in units of block data." Gallagher fails to provide any description of how pixel data is handled by the distortion corrector 6 other than the formula and further fails to determine an image range necessary to perform distortion correction and also fails to teach performing distortion correction processing in units of block data. For these reasons, it is submitted that claim 1 patentably distinguishes over Gallagher taken alone.

Claim 2 has been rejected under 35 U.S.C. §103(a) as unpatentable over Gallagher as applied in claim 1, in view of Yasuo Suda (U.S. Patent Application

Publication No. 2002/0122124) (hereinafter, "Suda"). Claim 2 having been canceled and its limitations incorporated into claim 1, this rejection is respectfully traversed as regards amended claim 1.

It is submitted that amended claim 1 patentably distinguishes over Gallagher taken alone for the reasons set forth above.

The Examiner admits that Gallagher fails to disclose a distortion-correction coordinate transforming unit that outputs a coordinate transform by applying a predetermined distortion correction formula to the generated interpolation coordinate and relies upon Suda for teaching a distortion-correction coordinate transforming unit for outputting a coordinate transform by applying a predetermined distortion-correction formula to the generated interpolation coordinate, making reference to interpolation to correct misregistration as per paragraph [0130]; and subsequent distortion correction (making reference to paragraph [0131]).

Even assuming Suda to be combinable with Gallagher, it is submitted that the capabilities lacking in Gallagher as set forth above are likewise lacking in Suda and, as was pointed out above with regard to Gallagher, Suda fails to teach or even remotely suggest "sequentially performing distortion correcting processing on units of block image data obtained by dividing image data" and lacks a further capability of "calculating an input image range necessary for performing distortion correction processing in units of block image data."

For these reasons, it is submitted that Gallagher and Suda, taken either alone or in combination, fail to teach or even remotely suggest the features of amended claim 1 recited above.

Claims 3, 4 and 5 have been rejected under 35 U.S.C. 103(a) as unpatentable over Gallagher and Suda as applied to claim 2 and further in view of Kazuyuki Nako (U.S. Patent No. 5,940.544) (hereinafter, "Nako").

Even assuming Nako to be combinable with Gallagher and Suda, it is submitted that claims 3-5 patentably distinguish over Gallagher and Suda for the reasons set forth above regarding claim 2, the limitations of which have been added to amended claim 1. It is submitted that Nako is lacking in the same features lacking in Gallagher and Suda as pointed out above and even assuming for the sake of argument that Nako is combinable with Gallagher and Suda, it is submitted that claims 3-5 patentably distinguish over Gallagher and Suda taken with Nako.

Claim 6 has been rejected under 35 U.S.C. §103(a) as unpatentable over Gallagher and Suda as applied to claim 2 and further in view of Woo Jin Song et al. (U.S. Patent Application Publication No. 2002/0164083) (hereinafter, "Song et al."). This rejection is respectfully traversed.

Claim 6 depends from amended claim 1 which incorporates the limitations of canceled claim 2 and it is thus submitted that claim 6 is patentable over Gallagher and Suda taken alone.

Even assuming for the sake of argument that Song et al. is combinable with Gallagher and Suda, it is submitted that the limitations lacking in both Gallagher and Suda, as pointed out above, are likewise lacking in Song et al. It is thus submitted that claim 6 patentably distinguishes over the combination of Gallagher, Suda and Song et al.

Claim 7 has been rejected under 35 U.S.C. §103(a) as unpatentable over Gallagher and Suda as applied to claim 2 and further in view of Hiroyuki Suzuki et al. (U.S. Patent No. 6,801,671) (hereinafter, "Suzuki et al."). This rejection is respectfully traversed.

Since claim 7 depends from claim 1 amended, claim 7 patentably distinguishes over Gallagher and Suda taken alone. It is submitted that the limitations lacking in both Gallagher and Suda, as pointed out above, are likewise lacking in Suzuki et al. and it is submitted that claim 7 patentably distinguishes over the combination of Gallagher, Suda and Suzuki et al.

Claims 8-11 and 13 have been rejected under 35 U.S.C. §103(a) as unpatentable over Gallagher and Song et al. Claim 13 having been canceled, this rejection is respectfully traversed as regards to claims 8-11.

Claims 8-11 depend from claim 1 or from a claim which depends from claim 1 and it is submitted that claims 8-11 patentably distinguish over Gallagher taken alone for the reasons set forth above regarding claim 1.

Even assuming that Song et al. can be combinable with Gallagher, it is submitted that Song et al. is lacking in the features lacking in Gallagher, as was pointed out above, regarding amended claim 1 which now includes the limitations of canceled claim 2. It is thus submitted that claims 8-11 patentably distinguish over the combination of Gallagher and Song et al.

In view of the foregoing, it is submitted that claims 1 and 3-11 patentably distinguish over the cited prior art and reconsideration and allowance of these claims are earnestly solicited.
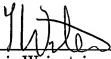

Conclusion

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that a telephone interview will help to materially advance the prosecution of this application, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

In view of the foregoing amendment and remarks, Applicants respectfully submit that the present application, including claims 1 and 3-11, is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

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Enclosure